

are conjugated systems which are made electrically conductive by doping." The claims now incorporate specific compounds for polymer, solvent and additive.

Pursuant to the Examiners comments in the Official Action noted above, Applicants have added the following language to Claim 1 and inherently all of the claims dependent thereon:

The doping step is embodied in the language: "*said doping reaction consisting of exposing said conjugated diene polymer to an acid-containing solution selected from the group consisting of hydrochloric acid, methanesulfonic acid, camphorsulfonic acid and acrylamidopropanesulfonic acid.*" The bases for this language is found in the specification on page 10, lines 14 - 18 and page 18, lines 2 and 9.

The forming of a film is defined as being performed "*via a technique selected from the group consisting of spin-coating or solution casting from said admixture, said resulting film possessing isotropic conductivity.*" The basis for this language is found in the specification on page 18, lines 13 and 14.

The Examiner has rejected claims under 35 U.S.C. §102(b) as anticipated by or in the alternative 35 U.S.C. §103(a) as obvious over Han (US 5,171,478) or Ikkala et al. (US 5,520,852).

Claim 11 has been amended to read: 11. "The method defined in Claim 1 wherein said method consists of a conjugated polymer which is polyaniline which is a substantially crystalline material which is dissolved in a solvent consisting of NMP to form a solution exhibiting bimodal or trimodal distribution in Gel Permeation Chromatography (GPC) as a result of aggregation induced by internal hydrogen bonding between chains in said polyaniline and exhibiting the GPC curve depicted in Figure 4, and said additive is 5% by weight poly-co-dimethyl propylamine siloxane. Applicants have limited the solvent to only NMP by use of the term "consisting of." It is thus NOT the same solvent.

In support of the assertion that the solvents used in the polyaniline systems are in fact different, the Examiner is directed to Column 18, lines 54 - 60 which disclose that there are degrees of solubility as set forth therein. Based upon Ikkala, one cannot infer that the properties are inherent.

Applicants do use the poly-co-dimethyl propylamine siloxane and obtain a synergistic result as demonstrated in the data presented in Figures 7 - 10. The results in the Figures demonstrate that the resultant properties of the product formed is substantively different from that. In view of the unexpected properties demonstrated in the specification, filed under oath, these results are conclusive.

Ikkala does not disclose the elements of Applicants' Claim 11 as presently written, so it does not anticipate same. There is no suggestion in Ikkala that would render Claim 11 to one skilled in the art.

Applicants again respectfully submit that it is improper for a rejection of the claims in this application under 35 U.S.C. §103(a) based upon "inherency." The Court of Appeals for the Federal Circuit has clearly stated the standard which applies to the examination of applications for Letters Patent in holding:

*"[A] retrospective view of inherency is not a substitute for some teaching or suggestion which supports the selection and use of the various elements in the particular claimed combination."* In re Newell, 897 F.2d 899 13 USPQ2d 1056 (Fed. Cir. 1990).

There is no disclosure in Han which meets each and every element of the excerpt of Claim 1 as set forth above; and, the assertion of inherency is improper.

The Examiner has rejected claims 1, 3-7, 9-11, 14-16, 20, 22-25 and 40-42 under 35 U.S.C. §102(b) as anticipated by or in the alternative 35 U.S.C. §103(a) as obvious over Han (US 5,171,478).

The remarks set forth above with respect to the rejection of Claim 11 are hereby incorporated by reference with respect to the above-noted rejection. The data disclosed in the drawings supports the conclusion that the present invention is different in kind as opposed to difference in degree with respect to Han.

The Examiner is respectfully requested to reconsider his rejection of claims 1, 3-7, 9-11, 14-16, 20, 22-25 and 40-42 under 35 U.S.C. §102(b) as anticipated by, or in the alternative, 35 U.S.C. §103(a) as obvious over Han (US 5,171,478) in view of Cao, et al. (5,232,631)

The remarks relating to the Han reference are again incorporated by reference herein as to this rejection. There is no suggestion in Han that would lead the skilled artisan to attempt to orient a film made by a different process such as the ones disclosed in Han and Cao.

The Examiner has commented on Example 6 pointing to where Han teaches stretch orientation and contends that Han teaches the use of a plasticizer and a solvent. The Examiner has totally ignored the rest of the limitations in Applicants' claims as now written, for which there is no teaching or suggestions in Han. Applicants' claims distinguish over Han and Cao, et al. in that Applicants now include limitations which are not found in Han which render the subject matter patentable.

For the sake of accuracy, Example 6 of Han states:

*"Green conductive poly(anilinium tosylate) powders (5 g) was prepared as in Example 3, and was suspended in 35 mL of N-methyl pyrrolidinone..."*

Applicants respectfully point out at this point of the Han Disclosure that Han clearly states that the aforementioned powder is SUSPENDED in the NMP. This is contrary to what Applicants have disclosed and claimed, i.e. the polymer is DISSOLVED in the NMP solution. It is only "After the addition of 3.3 g of tripropylamine, the suspended

*poly(anilinium tosylate) powder started to dissolve forming a blue solution of low viscosity (water-like viscosity)..."* Applicants use only NMP as the solvent to put the polymer into solution.

As stated above, there is no teaching of, suggestion for or motivation for Applicants' invention as now claimed and thus there is no showing of *prima facie* obviousness.

there is no rejection in the record based upon inherency, and inherency can not support an obviousness rejection, since what is inherent in a reference is not taught by the reference.

Finally, The Examiner rejected claims under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Elsenbaumer (U.S. 4,983,322).

Elsenbaumer discloses a method of using a solution to form a conducting polymer. He discloses polyaniline in combination with an oxidizing dopant. He illustrates the useful dopants by disclosing a list of compounds, a substantial number of which are halogen-containing compounds. His preferred dopants are chlorine and bromine-containing compounds with the most preferred dopant being FeCl<sub>3</sub>. Elsenbaumer uses his dopant to modify the electrical properties of the polymer. This is an inherent difference in kind as compared with the present invention. Appellants have emphasized in the specification (page 11) that the morphology of a polymer is very important in determining the polymer's physical, mechanical and electronic properties.

Applicants specifically state that prior art polyaniline base films of the type disclosed by Applicants have obtained an unexpected benefit as a result of their discovery that the additive provides local mobility to the polymer to allow the polymer chains to associate

tightly with one another to achieve a high crystalline state.

Applicants have provided experimental data (under oath) that clearly establishes and supports the necessary difference in kind rather than degree of the oxidant that they use as opposed to the dopant of Elsenbaumer under similar conditions. The preferred  $\text{FeCl}_3$  species in solution of Elsenbaumer provides the  $\text{Cl}^-$  ions analogous to the  $\text{HCl}$  used by Appellants in their comparative evaluation. The enhanced crystallinity (one of the objects of the invention) enhances the electrical properties and renders the Applicants' invention an unexpected improvement.

As noted above, it is improper to reject the claims as now amended in view of Elsenbaumer using an "inherency" assertion under 35 U.S.C. §103(a). The remarks relating to difference in kind versus degree which are presented with respect to the Han reference are incorporated by reference with respect to the Elsenbaumer reference.

For the Examiner to properly make the assertions on concerning "Inherency" that he has on the record with respect to rejecting the Applicants' claims over Cao, Han, Ikkala and Elsenbaumer, he is obligated to produce specific support for his assertions as to patentability or an Affidavit as provided for under 37 C.F.R. 104(d)(2) for the Examiner to qualify himself as an expert to make these statements.

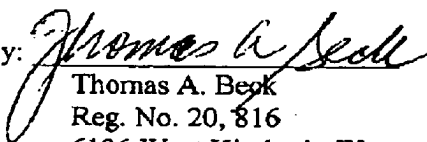
Please address all future correspondence relating to this application to the undersigned at 6136 West Kimberly Way, Glendale, AZ 85308-7627

RECEIVED  
CENTRAL FAX CENTER

DEC 03 2008

The Commissioner is requested to grant a 3 month extension of time within which to respond to the Office Action noted above. A check for \$1020.00 to cover the cost of the extension fee is enclosed.

Respectfully submitted,

By:   
Thomas A. Beck  
Reg. No. 20,816  
6136 West Kimberly Way  
Glendale, AZ 85308-7627

I hereby certify that this paper is being mailed via the United States Postal Service first class mail, postage pre-paid on the date indicated below addressed to The Commissioner of Patents & Trademarks, Post Office Box 1450, Alexandria, VA 22313-1450

Signature:   
Name: Thomas A. Beck

Date: June 13, 2007

-7-

The PTO did not receive the following  
listed item(s) no check

## APPENDIX - CLAIMS

1. (Currently Amended) A method comprising forming an admixture of a solvent,  
an additive, said solvent being different from said additive and  
a conjugated diene polymer selected from the group consisting of a precursor to an electrically  
conductive conjugated diene polymer and an electrically conductive conjugated diene polymer,  
said precursor to said electrically conductive conjugated diene polymer said conjugated diene  
polymer being made electrically conductive by means of a doping reaction;  
said doping reaction consisting of exposing said conjugated diene polymer to an acid-containing  
solution selected from the group consisting of hydrochloric acid, methanesulfonic acid,  
camphorsulfonic acid and acrylamidopropanesulfonic acid  
said conjugated diene polymer being soluble in said solvent,  
said conjugated diene polymer not being substantially soluble in said additive in the absence of  
said solvent;  
said additive provides local mobility to said polymer to allow regions of said conjugated diene  
polymer to associate with one another to achieve a crystalline state; and  
removing or partly removing said solvent, substantially leaving said additive therein as remaining  
additive, said remaining additive provides local mobility to said conjugated diene polymer to  
achieve said crystalline state thereby comprising a polycrystalline material, said polycrystalline  
material is characterized by a degree of crystallinity regions and  
a degree of amorphous regions, said degree of crystallinity regions and said degree of amorphous  
regions are selected by selecting the composition of said additive, and the amount of said  
additive;  
forming a film via a technique selected from the group consisting of spin-coating or solution  
casting from said admixture, said resulting film possessing isotropic conductivity.

2. (Canceled)

3. (Previously Presented) A method according to claim 1, wherein said additive is selected from the group consisting of plasticizers and diluents.
4. (Previously Presented) A method according to claim 1, wherein said additive is a plasticizer is selected from the group consisting of: Adipic acid plasticizers, Azelaic acid plasticizers, Benzoic acid plasticizers, Citric acid plasticizers, Dimer acid plasticizers, Epoxy plasticizers, Fumaric acid plasticizers, Glycerol plasticizers, Isobutyrate plasticizers, Lauric acid plasticizers, Linoleic acid plasticizers, Maleic acid plasticizers, Sebacic acid plasticizers, Stearic acid plasticizers, Succinic acid plasticizers, Sulfonic acid plasticizers, Terpentines, Terpentine plasticizers, Siloxanes, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose plasticizers, Mellitates, Myristic acid plasticizers, Oleic acid plasticizers, Palmitic acid plasticizers, Paraffin plasticizers, Phosphoric acid plasticizers, Phthalic acid plasticizers, Ricinoleic acid plasticizers, Tartaric acid plasticizers, Trimellitic acid plasticizers, Glycol plasticizers, Glycolates, Hydrocarbons, Phosphonic acid plasticizers, and Polysilanes.
5. (Previously Presented) A method according to claim 1, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfurans, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.
6. (Previously Presented) A method according to claim 1, wherein said solvent, when removed or partly removed forms a film which is further stretch oriented.



7. (Currently Amended) A method of fabricating a precursor to an electrically conductive conjugated polymer and an electrically conductive polymer comprising:

admixing a combination of a first material, a second additive doping material and a solvent:

said first material is selected from the group consisting of a precursors to an electrically conductive conjugated polymer polymer and an electrically conductive conjugated polymer polymer;

said second additive doping material being soluble in said solvent, said second additive doping material not being substantially soluble in said first material in the absence of said solvent;

contacting said first material with said additive doping material to render said first material electrically conductive by means of a doping reaction and providing local mobility to said first material to allow said conjugated polymer polymers to associate with one another to achieve a crystalline state;

removing or partly removing said solvent, substantially leaving said additive doping material therein as a remaining additive doping material, said remaining additive doping material providing local mobility to said first material to achieve said crystalline state thereby comprising a polycrystalline material, said polycrystalline material is characterized by a degree of crystallinity regions and

a degree of amorphous regions, said degree of crystallinity regions and said degree of amorphous regions are selected by selecting the composition of said additive, and the amount of said additive;

forming a film via a technique selected from the group consisting of spin-coating or solution casting from said admixture, said film possessing isotropic conductivity.

8. (Canceled) A method according to claim 7, wherein said combination is electrically conductive and has a conductivity which is isotropic.
9. (Previously presented) A method according to claim 7, wherein said polymer is selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polythianaphthenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfurans, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other polymers and copolymers of the monomers thereof.
10. (Previously presented) A method according to claim 7, wherein said second material is selected from the group consisting of:  
Adipic acid plasticizers, Azelaic acid plasticizers, Benzoic acid plasticizers, Citric acid plasticizers, Dimer acid plasticizers, Epoxy plasticizers, Fumaric acid plasticizers, Glycerol plasticizers, Isobutyrate plasticizers, Lauric acid plasticizers, Linoleic acid plasticizers, Maleic acid plasticizers, Sebacic acid plasticizers, Stearic acid plasticizers, Succinic acid plasticizers, Sulfonic acid plasticizers, Terpentines, Terpentine plasticizers, Siloxanes, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose plasticizers, Mellitates, Myristic acid plasticizers, Oleic acid plasticizers, Palmitic acid plasticizers, Paraffin plasticizers, Phosphoric acid plasticizers, Phthalic acid plasticizers, Ricinoleic acid plasticizers, Tartaric acid plasticizers, Trimellitic acid plasticizers, Glycol plasticizers, Glycolates, Hydrocarbons, Phosphonic acid plasticizers, Polysilanes.
11. (Currently Amended) The method defined in Claim 1 wherein said method consists of a conjugated polymer which is polyaniline which is a substantially crystalline material which is dissolved in a solvent consisting of NMP to form a solution exhibiting bimodal or trimodal distribution in Gel Permeation Chromatography (GPC) as a result of aggregation induced by internal hydrogen bonding between chains in said polyaniline and exhibiting the GPC curve depicted in Figure 4, and said additive is 5% by weight poly-co-dimethyl propylamine siloxane.

12. (Canceled) A method comprising:  
providing solution of polymers in a solvent;  
said polymers are selected from the group consisting of precursors to electrically  
conductive polymers and electrically conductive polymers;  
providing mobility to said polymers to allow said polymers to associate with one another  
to achieve a crystalline state by adding a plasticizer to said solvent;  
said plasticizer being soluble in said solvent, said plasticizer not being substantially soluble in  
said polymer in the absence of said solvent.
13. (Canceled) A method according to claim 12, wherein said step of providing mobility is  
provided by adding an additive to said solution.
14. (Previously presented) A method according to claim 7 wherein said additive is selected  
from the group consisting of a plasticizer and a diluent.
15. (Previously Presented) A method according to claim 1, wherein said additive contains  
substituents which facilitate the miscibility of said polymer and said additive.
16. (Previously Presented) A method according to claim 1, wherein said additive disrupts  
aggregation of said polymer.
17. - 19 (Canceled)
20. (Previously Presented) A method according to claim 1, wherein said additive  
deaggregates said polymer.
21. (Canceled)

22. (Previously Presented) A method according to claim 1, wherein said solvent is extracted from said admixture by a technique selected from the group consisting of solvent extraction and evaporation.
23. (Previously Presented) A method according to claim 1, wherein said additive is first added to a solvent and thereafter an electrically conducting polyaniline is added which becomes neutralized upon addition to said admixture.
24. (Previously Presented) A method according to claim 1, wherein said admixture contains a polyaniline, said additive, and an oxidant.
25. (Previously presented) A method according to Claim 7, wherein said additive includes a plasticization effect.
- 26 - 39 (Cancelled)
40. (Previously Presented) A method according to claim 7 wherein said additive is an oxidant.
41. (Previously Presented) A method according to claim 7 wherein said material is an oxidant.
42. (Previously Presented) A method according to claim 7 wherein said plasticizer is an oxidant.
43. - 45. (Cancelled)

46. (Canceled) A method comprising forming an admixture of  
a solvent selected from the group consisting of NMP, m-Cresol and a combination of NMP/m-cresol;  
an additive selected from the group consisting of poly-co-dimethyl, amino siloxane, poly glycol diacid, 3,6,9-trioxaundecanoic acid, poly(ethylene glycol) tetrahydrofurfuryl ether, glycerol triacetate, and epoxidized soy bean oil.  
polyaniline,  
said polyaniline being soluble in said solvent,  
said polyaniline not being substantially soluble in said additive in the absence of said solvent;  
said additive provides local mobility to said polymer to allow said polymer to associate with one another to achieve a crystalline state; and  
removing or partly removing said solvent, substantially leaving said additive therein as remaining additive, said remaining additive provides local mobility to said polyaniline to achieve said crystalline state thereby comprising a polycrystalline material, said polycrystalline material is characterized by a degree of crystallinity regions and  
a degree of amorphous regions, said degree of crystallinity regions and said degree of amorphous regions are selected by selecting the composition of said additive, and the amount of said additive,  
said admixture being electrically conductive and having an isotropic electrical conductivity.

47. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is epoxidized soy bean oil.

48. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is poly-co-dimethyl, amino siloxane.

49. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is poly glycol diacid.

50. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is 3,6,9-trioxaundecanoic acid.

51. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is poly(ethylene glycol) tetrahydrofurfuryl ether.

52. (Withdrawn) The method according to claim 53, wherein said solvent is NMP and said additive is glycerol triacetate.

53. (Withdrawn) The method defined in Claim 7, comprising forming an admixture of:

a solvent selected from the group consisting of NMP, m-Cresol and a combination of NMP/m-cresol;

an additive selected from the group consisting of poly-co-dimethyl, amino siloxane, poly glycol diacid, 3,6,9-trioxaundecanoic acid, poly(ethylene glycol) tetrahydrofurfuryl ether, glycerol triacetate, and epoxidized soy bean oil.

polyaniline,

said polyaniline being soluble in said solvent,

said polyaniline not being substantially soluble in said additive in the absence of said solvent;

said additive provides local mobility to said polymer to allow said polymer to associate with one another to achieve a crystalline state; and

removing or partly removing said solvent, substantially leaving said additive therein as remaining additive, said remaining additive provides local mobility to said polyaniline to achieve said crystalline state thereby comprising a polycrystalline material,

said polycrystalline material is characterized by a degree of crystallinity regions and a degree of amorphous regions, said degree of crystallinity regions and said degree of amorphous regions are selected by selecting the composition of said additive, and the amount of said additive.

said admixture being electrically conductive and having an isotropic electrical conductivity.

54. (Previously Presented) The method comprising forming an admixture of a solvent selected from the group consisting of DMSO, DMF, NMP, dimethylene propylene urea, tetramethyl urea, pyridine, toluene, m-Cresol, phenol, dimethylacetamide, n-cyclohexylpyrrolidinone, 80% aqueous acetic acid, 60 - 88% aqueous formic acid, pyrrolidinone, N1N' dimethyl propyl urea, benzyl alcohol, and a combination of NMP/m-cresol;  
an additive selected from the group consisting of Adipic acid, Azelaic acid, Benzoic acid, Citric acid, Dimer acid, Epoxy, Fumaric acid, Glycerol, Isobutyrate, Lauric acid, Linoleic acid, Maleic acid, Sebacic acid, Stearic acid, Succinic acid, Sulfonic acid, Terpentines, Siloxanes, Polysiloxanes, Ethylene glycols, Polyethylene glycols, Polyesters, Sucrose, Mellitates, Myristic acid, Oleic acid, Palmitic acid, Paraffin, Phosphoric acid, Phthalic acid, Ricinoleic acid, Tartaric acid, Trimellitic acid, Glycol, Glycolates, Hydrocarbons, Phosphonic acid, and Polysilanes, said solvent being different from said additive and  
a polymer selected from the group consisting of a precursor to an electrically conductive polymer and an electrically conductive polymer,  
said precursor to said electrically conductive polymer being made electrically conductive by means of a doping reaction with an acid, said polymer being selected from the group consisting of substituted and unsubstituted polyparaphenylene vinylenes, polyparaphenylenes, polyanilines, polythiophenes, polyazines, polyfurans, polypyrroles, polyselenophenes, poly-p-phenylene sulfides, polyacetylenes formed from soluble precursors, combinations thereof and blends thereof with other copolymers of the monomers thereof;  
said polymer being soluble in said solvent,  
said polymer not being substantially soluble in said additive in the absence of said solvent;  
said additive provides local mobility to said polymer to allow regions of said polymer to

associate with one another to achieve a crystalline state; and removing or partly removing said solvent, substantially leaving said additive therein as remaining additive, said remaining additive provides local mobility to said polymer to achieve said crystalline state thereby comprising a polycrystalline material, said polycrystalline material is characterized by a degree of crystallinity regions and a degree of amorphous regions, said degree of crystallinity regions and said degree of amorphous regions are selected by selecting the composition of said additive, and the amount of said additive;

forming a film from said admixture, said film possessing isotropic conductivity.

55. (Previously Presented) The method defined in Claim 54 wherein said solvent is cresol, said polymer is polyaniline and said additive is poly-co-dimethyl propylamine siloxane.

56. (Previously Presented) The method defined in Claim 54 wherein said solvent is NMP/cresol, said polymer is polyaniline and said additive is poly-co-dimethyl propylamine siloxane.



**Application Serial Number 09/346,353**

**Revised page 8**